

A New Subspecies of *Volutoconus hargreavesi* (ANGAS, 1872) from Central Western Australia

(Gastropoda : Volutidae)

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(Plate 41; 1 Map)

DURING THE 1960 Hawaiian-Western Australian Expedition, of which I was a member, we dredged the first recorded living *Volutoconus hargreavesi* (ANGAS, 1872) from 23 fathoms off Bezout Island, Dampier Archipelago, north Western Australia (Plate 41, Figures 3, 4). Several weeks earlier and a thousand miles south of Dampier, we had examined a shell (Plate 41, Figure 7) collected in the Houtman Abrolhos Islands (45 miles west of Geraldton) and found that it differed sculpturally from the northern *V. hargreavesi* to such a degree that it appeared to be a new species of volute (WEAVER, 1960).

About this time, Dr. Donald F. McMichael was working on *Volutoconus grossi* (IREDALE, 1927) from the east coast of Australia. In his investigation, McMICHAEL (1960) found that the shell of *V. grossi* exhibited a considerable amount of sculptural variation along its north-south coastal range, particularly with respect to the presence or absence of nuclear ribbing. This ribbing is obscured by a nacre glaze in southern populations. A further difference, not reported by McMICHAEL, appears to be the almost total lack of a raised columellar callus just above the fourth posterior plait, in the northern form from off Townsville, Queensland. He subsequently named this population *Volutoconus grossi helenae* McMICHAEL, 1966, in honor of his wife.

In the years following our 1960 Expedition, more shells turned up on the west coast representing both the northern *Volutoconus hargreavesi* and the southern Houtman Abrolhos Islands form, including a live specimen of the latter trawled by Will Goode from 118 fathoms off Point Cloates (Plate 41, Figures 8, 9).

Keeping McMICHAEL's observations in mind and with these additional specimens to study, it became apparent that the southern shells from the Houtman Abrolhos Islands north to North West Cape represented a popu-

lation which differed consistently in sculpture from *Volutoconus hargreavesi*. Up to the time of this writing, no intergradation has been observed.

I, therefore, propose to establish this southern population as a new subspecies of *Volutoconus hargreavesi* (ANGAS, 1872).

Before describing this subspecies, I will briefly outline the genus and nominate subspecies that are involved.

Volutoconus CROSSE, 1871

1871. *Voluta (Volutoconus)* CROSSE, Journ. Conchylol. 19: 306 (Raised to full generic rank by McMICHAEL, 1960).

Type Species: *Voluta coniformis* Cox, 1871; Recent, Australia; by monotypy.

So far as is presently known, the genus is restricted to east, north and west Australian waters.

The single most outstanding morphological characteristic of the four species and two subspecies comprising the living representatives of this genus is the needle-like spur or calcarella which protrudes from the first whorl. However, according to McMICHAEL (1966): "The significance of this structure, from the taxonomic point of view, is uncertain since *Volutoconus* does not seem to be related in anatomy or radular structure to the Scaphelloides." The Scaphelloides, from the Western Atlantic off Florida, have a similar calcarella.

Shells moderately large, solid, either with dark chocolate revolving and axial bands on a cream-colored background as in *Volutoconus bednalli* (BRAZIER, 1879) or brightly colored in yellowish-orange and orange-red with white triangular designs. Spire may be elevated (*V. grossi*

and *V. hargreavesi*) or depressed (*V. coniformis*) and the nucleus may show radial ribbing or the ribbing may be covered over by a nacre glaze (southern *V. grossi* and northern *V. hargreavesi*). Post-nuclear and body whorls may be longitudinally plicate (southern *V. hargreavesi*) or relatively smooth (northern *V. hargreavesi*). Columella with 4 to 5 plaits. Radula, where known (*vide* ABBOTT, 1958), uniserial with 35 to 40 large, tricuspid teeth.

Volutoconus hargreavesi hargreavesi (ANGAS, 1872)
(Plate 41, Figures 1 to 4; Map)

1872. *Voluta hargreavesi* ANGAS, Proc. Zool. Soc. London, p. 613, pl. 42, fig. 13 (no locality given)

1960. *Volutoconus hargreavesi* (ANGAS, 1872), WEAVER, Hawaiian Shell News 8 (11): 1, 3 (two shells top left, two shells bottom left)

Holotype: American Museum of Natural History, New York (AMNH no. 8304)

Type Locality: Bezout Island, Dampier Archipelago, north Western Australia, where the first living specimen was collected, designated by WEAVER, 1960

Range: Dampier Archipelago, south to Long Island in Exmouth Gulf, north Western Australia. Appears to inhabit moderately deep water. Only recorded live specimen taken in 23 fathoms.

Shell Description: Shell solid, of medium size (at least 88.3 mm in length), either narrow or somewhat bulbous. Nucleus smooth, of about 4 whorls, with needle-like calcarella protruding from apex. Second and third nuclear whorls white, rest of nucleus orange. Surface of shell longitudinally sculptured with closely spaced growth lines. A slight bulge at shoulder of each whorl. Color bright orange-red with white triangular markings showing

through, principally in 3 bands: one at periphery of body whorl, one below suture and another at anterior tip. Columella straight with four well developed plaits. Aperture white, siphonal notch deep.

In his original description ANGAS stated that there were 3 columellar plaits. This is an error; I have examined the holotype and it has 4 plaits, as do all others of the northern *Volutoconus h. hargreavesi* that I have seen.

Unfortunately, the animal taken during the 1960 Hawaiian-Western Australian Expedition was found to be damaged when extracted from the shell (McMichael, *in litt.*) and as a result we cannot make a report here on anatomical features of this subspecies.

Remarks: As far as is presently known, this is the first time that photographs have ever been published of the holotype of *Volutoconus h. hargreavesi*.

Volutoconus hargreavesi daisyae WEAVER, subsp. nov.
(Plate 41, Figures 5 to 9; Map)

Shell Description: There are two outstanding diagnostic shell characteristics associated with this southern subspecies that appear in every specimen I have seen which distinguish it from the northern *Volutoconus h. hargreavesi*. The first and most important one is the presence of a fifth weak posterior columellar plait, more deeply recessed within the aperture than the remaining 4 plaits and at almost a right angle to the shell's vertical axis. The second characteristic is the presence of ribbing on the nucleus and all post-nuclear whorls.

Shell large (adult specimens from 75 mm to 125 mm in length), solid. Color a shiny pale yellowish orange overlaid with irregular white tent-like markings which form a broad band at periphery of last whorl and two interrupted bands situated immediately anterior to suture, and just posterior to basal fasciole. Spire elevated, nucleus of $3\frac{3}{4}$

Explanation of Plate 41

Volutoconus hargreavesi hargreavesi (ANGAS, 1872)

Figures 1, 2: Holotype, *ex* American Museum of Natural History, No. 8304; no locality data on original label; Height 88.3 mm, maximum diameter 39.4 mm; photographs courtesy AMNH.

Figures 3, 4: *ex* Bernice P. Bishop Museum, No. 214693; dredged alive in 23 fathoms, off Bezout Island, Dampier Archipelago, north Western Australia; Height 75.0 mm, maximum diameter 28.0 mm; photographs by Clifton Weaver

Volutoconus hargreavesi daisyae WEAVER, subsp. nov.

Figures 5, 6: Holotype, *ex* Delaware Museum, No. 10022; freshly dead specimen trawled in 80 fathoms southwest of North West Cape, central Western Australia; Height 85.3 mm, maximum diameter 34.3 mm; photographs by Clifton Weaver

Figure 7: Paratype no. 2; *ex* Helen Boswell coll.; taken from cray-pot in 85 fathoms; Houtman Abrolhos Islands, south Western Australia; Height 96 mm, maximum diameter 39 mm; photograph by Arch Whitworth

Figures 8, 9: Paratype no. 1; *ex* Clifton Weaver coll.; trawled alive in 118 fathoms off Point Cloates, central Western Australia; Height 85.5 mm, maximum diameter 34.0 mm; photographs by Clifton Weaver



Figure 1

Figure 2

Figure 3

Figure 4



Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

